

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 2 of 18

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-16 (canceled).

Claim 17 (previously presented): An image processing device for situating objects in virtual space by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as the reference in said virtual space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera to improve the visibility of the polygons from the virtual camera; wherein

said polygon tilting means tilts said polygons only when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 18 (original): The image processing device according to Claim 17, wherein said reference plane is the ground, and said polygons are polygons forming lines situated on said ground.

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 3 of 18

Claim 19 (original): The image processing device according to Claim 17, wherein said polygons are quadrilateral, and said polygon tilting means modifies the coordinate values of the vertices on one of the sides of mutually facing sides of said polygons.

Claim 20 (canceled).

Claim 21 (currently amended): The image processing device according to Claim 2055, wherein said camera angle adjusting means further adjusts the angle of said virtual camera based on ~~the results of said determination and the direction in which said objects are~~ object is moving.

Claim 22 (currently amended): The image processing device according to claim 21 or 2255, wherein said camera angle adjusting means ~~adjusts~~ can adjust the angle of said virtual camera in ~~at least one of either~~ the lateral and vertical directions in said virtual space.

Claim 23 (canceled).

Claim 24 (previously presented): An image processing device having an image generating display means for converting virtual space constructed with a three-dimensional model including a plurality of polygons to two-dimensional images seen from a virtual camera in any position, and displaying them on a display device, wherein said image processing device comprises:

angle computing means for computing the angle between an eye direction vector showing the direction in which said virtual camera is facing and a normal line vector showing the orientation of the plane of certain polygons situated in said virtual space;
and

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 4 of 18

polygon tilting means for changing the coordinate values of the vertices of said polygons, so that the angle computed by said angle computing means assumes a desired value, such that the visibility of the polygons from the virtual camera is improved; wherein

the shape of an object formed by the polygons is modified such that the visible area thereof is increased.

Claim 25 (canceled).

Claim 26 (currently amended): Data recording media including a program to enable a computer system to function as an image processing device according to any of Claims 17 through 19, 21, 22 and 24.

Claim 27 (previously presented): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as a reference in said virtual three-dimensional space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to increase the surface area of said polygons seen from the virtual camera to improve the visibility of the polygons from the virtual camera; wherein

said polygon tilting means tilts said polygons only when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 5 of 18

Claim 28 (previously presented): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as a reference in said virtual three-dimensional space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to allow the vertices in the interior, relative to said virtual camera, of said polygons to stand out from said reference plane, while centered on the vertices in the from, relative to said virtual camera, of said polygons; wherein

said polygon tilting means tilts said polygons only when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 29 (original): A game machine, characterized by comprising an image processing device according to Claim 27 or 28, for executing a game by situating objects in said virtual three-dimensional space and by controlling said objects according to player input control and set rules.

Claim 30 (previously presented): The game device according to Claim 29, characterized in that said game is a game in which objects are situated in a game field formed on a reference plane, and said polygons are polygons forming lines [described on] designating boundaries of said game field.

Claim 31 (previously presented): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 6 of 18

virtual camera, wherein said image processing device comprises:

polygons forming lines situated in said virtual three-dimensional space;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results determined by said determination means, so as to increase the surface area of said polygons as seen from the virtual camera to improve the visibility of said polygons; wherein

said polygon tilting means tilts said polygons only when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 32 (original): The image processing device according to Claim 27, 28 or 31, characterized in that said polygons are polygons that show lines.

Claim 33 (original): A game device, characterized by comprising an image processing device according to Claim 31, for executing a game by situating objects in said virtual three-dimensional space and by controlling said objects according to player input control and set rules.

Claim 34 (original): The game device according to Claim 33, characterized in that said game is a game in which objects are situated on a plane, and said polygons are polygons forming lines described on said plane.

Claim 35 (previously presented): A game device for situating objects in virtual space formed in a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space on a screen as seen from a virtual camera, said game device comprising:

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 7 of 18

polygons forming boundary lines of a game field situated along a reference plane serving as a reference in a virtual space such that the reference plane and the polygons have a predetermined, fixed relationship to one another; and

a position changing means for changing positions of said polygons to enlarge an area of said polygons according to the angle relationship between said virtual camera and said polygons, such that the visibility of the polygons from the virtual camera is improved.

Claim 36 (canceled).

Claim 37 (previously presented): An image processing device for situating objects in virtual space by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as the reference in said virtual space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera to improve the visibility of the polygons from the virtual camera; wherein

said polygon tilting means tilts said polygons when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 38 (currently amended): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 8 of 18

virtual camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as a reference in said virtual three-dimensional space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to increase the surface area of said polygons seen from the virtual camera to improve the visibility of the polygons from the virtual camera; wherein

said polygon tilting means tilts said polygons when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 39 (previously presented): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated along a reference plane serving as a reference in said virtual three-dimensional space such that the reference plane and the polygons have a predetermined, fixed relationship to one another;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to allow the vertices in the interior, relative to said virtual camera, of said polygons to stand out from said reference plane, while centered on the vertices in the front, relative to said virtual camera, of said polygons; wherein

said polygon tilting means tilts said polygons when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 9 of 18

Claim 40 (previously presented): An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated in said virtual three-dimensional space;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results determined by said determination means, so as to increase the surface area of said polygons as seen from the virtual camera to improve the visibility of said polygons; wherein

said polygon tilting means tilts said polygons when the polygons forming lines are at least a predetermined distance away from the virtual camera.

Claim 41 (previously presented): A game image processing method using a game device for situating objects in virtual space by a computer system, developing a game while controlling the movements and positions of said objects, and displaying images in said virtual space as a screen seen from a virtual camera positioned at a predetermined viewpoint, said game image processing method comprising the steps of:

determining a positional relationship between a line polygon situated along a reference plane serving as a reference in said virtual space and said virtual camera, based on a positional coordinate of the line polygon, a positional coordinate of said viewpoint, and a distance and an angle between said line polygon and said virtual camera; and

changing a positional coordinate of a vertex of said line polygon such that an area of said line polygon increases as viewed from said virtual camera.

Claim 42 (previously presented): The game image processing method of Claim

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 10 of 18

41, further comprising the step of:

adjusting a direction of said virtual camera based on a moving direction of an object controlled by an input signal that is input by a player controlling an input device.

Claim 43 (previously presented): The game image processing method of Claim 41, further comprising the step of:

adjusting a direction of said virtual camera based on a position of an object controlled by a player and an attention point of said virtual camera corresponding to a predetermined area of said virtual space.

Claim 44 (previously presented): The game image processing method of Claim 43, further comprising the step of:

zooming said virtual camera based on said attention point of said virtual camera and said position of said object controlled by said player.

Claim 45 (previously presented): The game image processing method of Claim 41, wherein said reference plane is the ground, and said line polygons are polygons forming lines situated on said ground.

Claim 46 (previously presented): The game image processing method of Claim 41, wherein said line polygons are lines on a field in a ball game and said objects are participants in the ball game and a ball.

Claim 47 (previously presented): A game image processing method using a game device for situating objects in virtual space by a computer system, developing a game while controlling the movements and positions of said objects, and displaying images in said virtual space as a screen seen from a virtual camera positioned at a predetermined viewpoint, said game image processing method comprising the steps of:

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 11 of 18

determining whether or not said objects are in a field of view of said virtual camera;

computing an angle between an eye direction vector showing the direction in which said virtual camera is facing and a normal vector showing the orientation of a plane of certain polygons situated in said virtual space; and

changing coordinate values of vertices of said polygons, such that said angle has a desired value.

Claim 48 (previously presented): The game image processing method of Claim 47, further comprising the steps of:

adjusting a direction of said virtual camera based on a moving direction of an object controlled by an input signal that is input by a player controlling an input device.

Claim 49 (previously presented): The game image processing method of Claim 47, further comprising the step of:

adjusting a direction of said virtual camera based on a position of an object controlled by a player and an attention point of said virtual camera corresponding to a predetermined area of said virtual space.

Claim 50 (previously presented): The game image processing method of Claim 49, further comprising the step of:

zooming said virtual camera based on said attention point of said virtual camera and said position of said object controlled by said player.

Claim 51 (previously presented): The game image processing method of Claim 47, wherein said reference plane is the ground, and said line polygons are polygons forming lines situated on said ground.

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 12 of 18

Claim 52 (previously presented): The game image processing method of Claim 47, wherein said line polygons are lines on a field in a ball game and said objects are participants in the ball game and a ball.

Claim 53 (previously presented): The image processing device of Claim 17, wherein said polygons are lines on a field in a ball game and said objects are participants in the ball game and a ball.

Claim 54 (previously presented): The game device of Claim 35, wherein said objects are participants in a ball game and a ball.

Claim 55 (new): An image processing device for situating an object in a virtual space formed by a computer system, developing a game while controlling the movement of the object according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device comprises:

- a camera angle adjusting means for adjusting the angle of the virtual camera; wherein

- the virtual space includes a plurality of predetermined areas, each of the plurality of predetermined areas is assigned a single camera angle;

- the camera angle adjusting means adjusts the angle of the virtual camera to 0 degrees when the object is not located in one of the plurality of predetermined areas; and

- when the object is located in one of the plurality of predetermined areas, the camera angle adjusting means adjusts the angle of the virtual camera by the single camera angle assigned to the one of the plurality of predetermined areas.

Claim 56 (new): The image processing device according to claim 55, wherein

Serial No. 09/171,236
September 15, 2004
Reply to the Office Action dated May 17, 2004
Page 13 of 18

the camera angle adjusting means further adjusts the angle of said virtual camera based on the distance between the object and a second object.